

NOVEMBER MIDTERM EXAM

Answer the following questions

Question (1)

- (a) Define the following terms: (3 Marks)
(Feedback) – (Hysteresis) – (Oscillator) – (Phase-shift oscillator) –
(Frequency stability) – (Gain-bandwidth tradeoff).
- (b) State the PROS and CONS of the Feedback amplifiers. (3 Marks)
- (c) An amplifier without feedback has a voltage gain of 60 dB. The lower and upper cut-off frequencies of this amplifier are 100 Hz and 100 kHz respectively. Inclusion of negative feedback reduces the gain to 20 dB. Determine the bandwidth and the new gain. (4 Marks)
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Question (2)

- (a) Explain (with DRAW) the Wein-bridge oscillator circuit. Why is negative feedback employed in it, in addition to positive feedback? (4 Marks)
- (b) What are the needed conditions for sustaining the oscillation? And what will happen if they not verified? (3 Marks)
- (c) A Hartley Oscillator circuit having two individual inductors of 0.5 mH for each is designed to resonate in parallel with a variable capacitor that can be varied from 100 pF to 500 pF. Determine the upper and lower frequencies of oscillation and also the Hartley oscillator bandwidth. (3 Marks)